R·I·T Title: CDE ResMap 4 Point Probe

Semiconductor & Microsystems

Fabrication Laboratory **Revision: B** **Rev Date: 02/22/07**

Approved by:

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Process Engineer Equipment Engineer

1 SCOPE

The purpose of this document is to detail the use of the ResMap 4 Point Probe. All users are expected to have read and understood this document. It is not a substitute for in-person training on the system and is not sufficient to qualify a user on the system. Failure to follow guidelines in this document may result in loss of privileges.

2 REFERENCE DOCUMENTS

- ResMap Operations Manual

3 DEFINITIONS

n/a

4 TOOLS AND MATERIALS

4.1 General Description

4.1.1 The ResMap 4 Point Probe Rs Mapping Tool will accept manually loaded wafers from 2" to 8" in diameter. The probe that is currently being used is a Type A; the tip radius is 40 um, the spacing is 1mm and the force is 100g. This probe type is intended for measuring metal films, but may be used to measure implants and thin metals with less accuracy.

5 SAFETY PRECAUTIONS

5.1 Hazards to the Operator

5.1.1 The ResMap has movable stages which may create a pinch hazard. Do not operate with the cover open.

5.2 Hazards to the Tool

5.2.1 Do not attempt to remove or adjust the probe.

5.2.2 Be careful not to put anything in the path of motion that could jam the stage.

5.2.3 Contamination- no copper, gold or photoresist should be probed and wafers should be clean.

5.2.4 No wafer pieces are allowed on this tool. Wafer pieces should be probed manually.

6 INSTRUCTIONS

6.1 Initial State Check

6.1.1 Verify that the system and computer are powered up. There is a toggle switch on the right side of the ResMap. The computer will automatically start the 4 point probe program.

6.2 Reseting the System

6.2.1 If the system needs to be reset, shut off the power and select shutdown on the computer. Wait 20 seconds and turn on the ResMap and the computer. The software will automatically start.

6.3 Operating the system

6.3.1 Load your wafer with the flat oriented as shown on the stage.

6.3.1 To run an existing recipe, select **Operator** and then **Run Recipe**. Select the project name to display the recipes and then choose the recipe that you want.

6.3.2 The **Run Parameters** page will be displayed. Enter in the appropriate data such as **Run Titles**, **Operator**, **Run Parameters**, **Filename**, select the type of plot that you want and click **Autoprint**. Select **Run** to start the probe.

6.3.3 The wafer will be probed. The probe time will depend on the number of points probed as well as the number of times that each point is tried.

6.3.4 To pause the ResMap, hit the **Esc** button on the keyboard and then select either **Continue** or **Abort**.

6.3.5 Click **continue** at the top of the screen and the map will come up. Click **Print** if you want a printout.

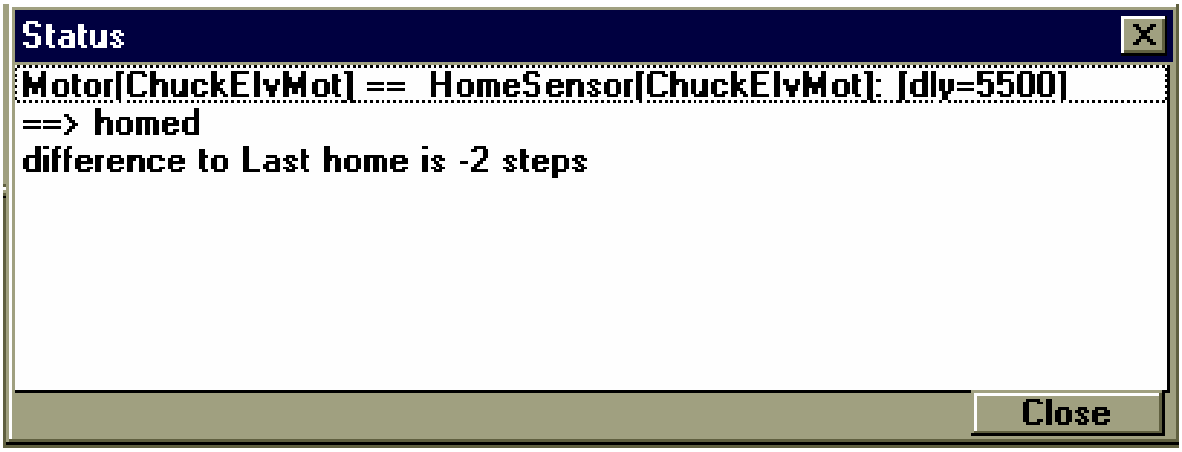
6.3.6 Alternately you may press the **Print Screen** button on the keyboard and paste into Paint. Select **Start**, **Programs**, **Accessories** and **Paint**. In **Paint**, select **Edit**, **Paste** and choose **Yes** to enlarge the bitmap.

6.3.7 On the **Run Parameters** screen select **Cancel** if you finished. If you want to probe another wafer with this recipe, load the wafer and select **Run**.

6.4 Errors during Run

6.4.1 If the computer displays a message that your file cannot be found, it may be because there is a space or an unrecognized character in the filename. All filenames are limited to 8 characters.

6.4.2 If you get the following error after probing a wafer and no data is displayed, the wafer is likely out of the range that the tool can measure. This can occur if there is an oxide left on the wafer or the resistivity or sheet resistance is too high.



7 APPROPRIATE USES OF THE TOOL

7.1 No copper, gold or photoresist should be probed and wafers should be clean.

7.2 No wafer pieces are allowed on this tool. Wafer pieces should be probed manually.

7.3 Wafers with oxide on top or with high resistivity or sheet resistance cannot be measured.

8 ATTACHMENTS

8.1 Viewing an Existing File

8.1.1 To view an existing file, select **Engineer** and **View Data**.
8.1.2 Under **Folders**, click **4P** and open your folder.
8.1.3 Under **filename** select the file that you want. The raw data will be displayed and may be printed.
8.1.4 To produce a contour plot or a 3D plot, select **Operator** and then either **Contour** or **3D**.

8.2 Writing a Recipe

8.2.1 Select **Engineer** and then **Edit Recipe** to display the **Project and Recipe File** screen. From this screen you can create a new project or recipe as well as rename or delete an existing recipe.
8.2.2 A **project file** may be set up as a place to store related recipes. To create a project file click **New Project**. To add a recipe to a project file, open the project and then select **New Recipe**.
8.2.3 When entering a new recipe use an 8 character filename without spaces.
8.2.4 Enter in your wafer diameter, thickness and flat size. Determine how many sites will be measured and use an edge exclusion of 5mm. You may also choose to measure **sheet resistance** in ohms per square or **resistivity** in ohm cm.
8.2.5 The Data Conversion mode may be used to determine the thickness of some metallic films. See page 1.2 in the ResMap manual.

REVISION RECORD

Summary of Changes	Originator	Rev/Date
Original Issue	Sean O'Brien	A-03/19/03
Added 6.3.6 for print screen function, added 6.4.2 for a common error, added 7.3	O'Brien	B- 02/22/07